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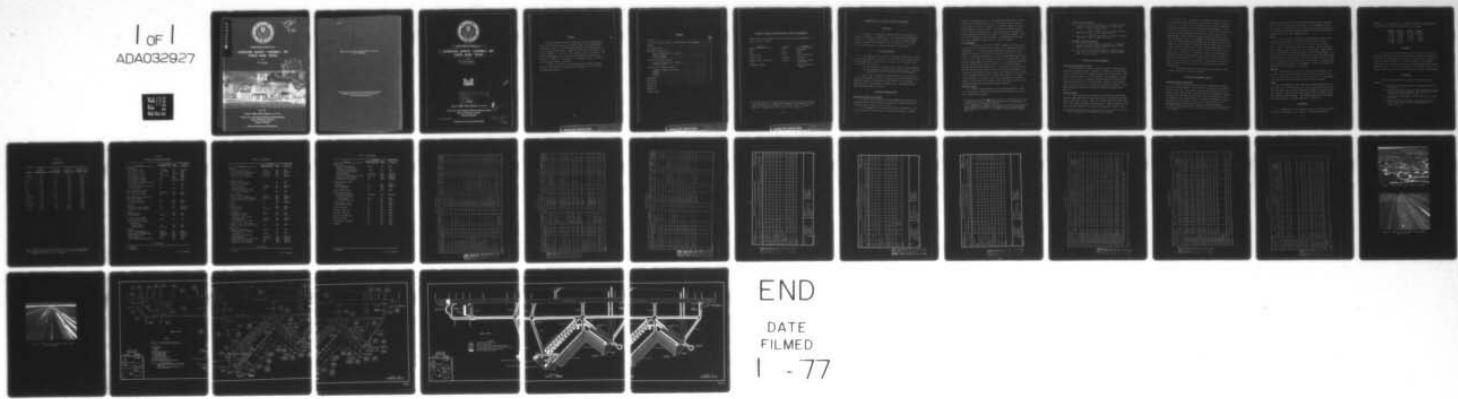
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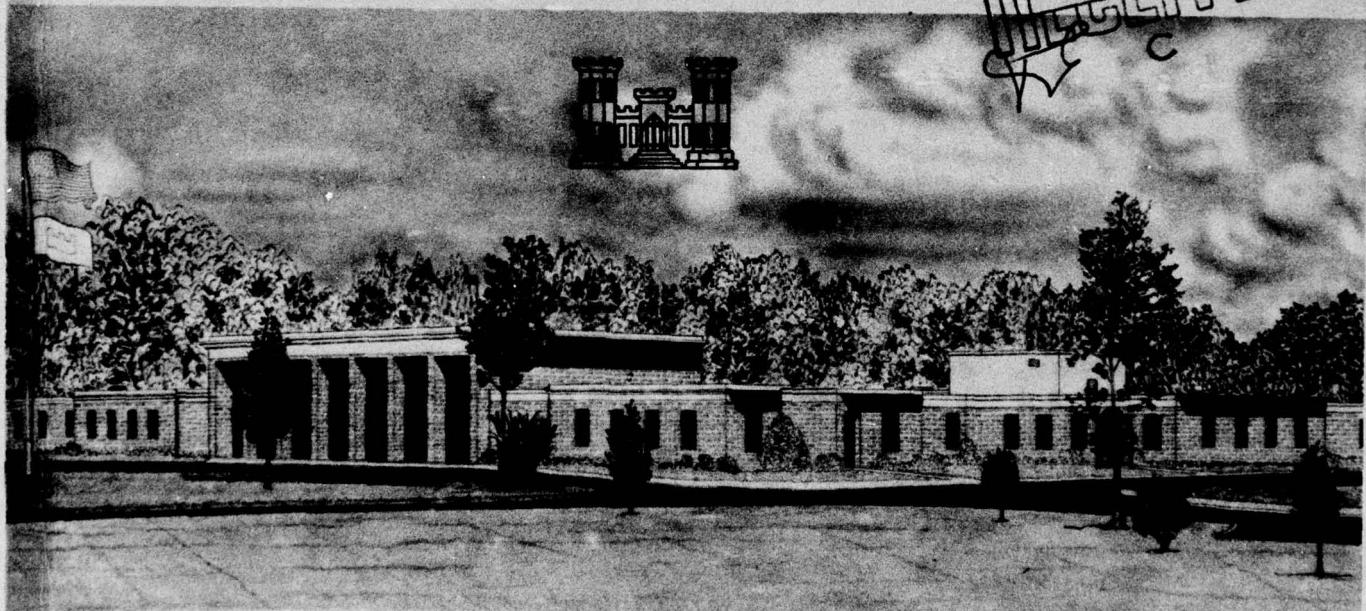
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MISCELLANEOUS PAPER S-73-39

CONDITION SURVEY, CARSWELL AIR FORCE BASE, TEXAS

by

R. D. Jackson



June 1973

Sponsored by Office, Chief of Engineers, U. S. Army

Conducted by U. S. Army Engineer Waterways Experiment Station
Soils and Pavements Laboratory
Vicksburg, Mississippi

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Foreword

The study reported herein was conducted under the general supervision of the Engineering Design Criteria Branch, Soils and Pavements Laboratory, of the U. S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Mississippi. Personnel involved in the condition survey were Messrs. R. D. Jackson, K. A. O'Connor, and S. R. Rowland. This report was prepared by Mr. Jackson under the general supervision of Messrs. J. P. Sale, R. G. Ahlvin, R. L. Hutchinson, and P. J. Vedros of the Soils and Pavements Laboratory.

COL Ernest D. Peixotto, CE, was Director of the WES during the conduct of the study and preparation of the report. Mr. F. R. Brown was Technical Director.

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Conversion Factors, British to Metric Units of Measurement

British units of measurement used in this report can be converted to metric units as follows:

<u>Multiply</u>	<u>By</u>	<u>To Obtain</u>
inches	2.54	centimeters
feet	0.3048	meters
square inches	6.4516	square centimeters
pounds (mass)	0.45359237	kilograms
pounds (force) per square inch	0.6894757	newtons per square centimeter
Fahrenheit degrees	*	Celsius or Kelvin degrees

* To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use the following formula: $C = (5/9)(F - 32)$. To obtain Kelvin (K) readings, use: $K = (5/9)(F - 32) + 273.15$.

CONDITION SURVEY, CARSWELL AIR FORCE BASE, TEXAS

Authority

1. Authority for conducting condition surveys at selected air-fields is contained in amendment to FY 1972 RDTE Funding Authorization (MFS-MC-5, 16 February 1972), subject: "Air Force Airfield Pavement Research Program," from the Office, Chief of Engineers, U. S. Army, Directorate of Military Construction, dated 18 February 1972.

Purpose and Scope

2. The purpose of this report is to present the results of a condition survey performed at Carswell Air Force Base (CAF^B), Texas, during 16-19 December 1972. The following two major areas of interest were considered in this survey:

- a. The structural condition of the primary airfield pavements.
- b. The condition of pavement repairs and the types of maintenance materials that have been used at this airfield.

3. This report is limited to a presentation of visual observations of the pavement conditions, discussion of these observations, and pertinent remarks with regard to the performance of the pavements. No physical tests of the pavements, foundations, or patching materials were performed during this survey.

Pertinent Background Data

General description of airfield

4. CAF^B is located adjacent to Texas Highway 183, between U. S. Interstate 20 and Texas Highway 199, northwest of downtown Fort Worth. A vicinity map is shown in plates 1 and 2.

5. In December 1972, the airfield facilities consisted of a N-S (17-35) runway, a parallel taxiway, 9 connecting taxiways, 3 ladder

taxiways, 5 parking aprons (i.e., the north and south aprons, the transient apron, and alert aprons A and B), 18 parking stubs, a warm-up apron, a power check pad, a washrack, a calibration hardstand, and two hangar aprons and access taxiways. The runway was 300 ft* wide and 12,000 ft long; the aprons were of various dimensions (see plate 1); and the taxiways were 50 and 75 ft wide and of various lengths. A layout of the airfield is shown in plate 1. A pavement plan indicating the type of pavement on each facility is shown in plate 2.

Site conditions

6. The climate in the area of CAFB is normally of a clear and sunny nature and of relatively low humidity. The average yearly mean temperature is 66 F, with recorded yearly mean extremes of 76 and 55 F. Temperature and precipitation data are presented in table 1. The amounts of departure from normal for the 1971 temperatures and precipitation are for periods of record of 76 and 84 yr, respectively. Annual precipitation averages approximately 41.2 in. The topography surrounding the airfield affords natural facilities for excellent surface drainage and rapid storm water runoff. An adequate storm sewer system provides the necessary facility for the collection and disposal of all storm water into natural drainage areas. The subgrade soil at the airfield is composed generally of a reddish-brown sandy clay and clay of CL classification.** The water table is not encountered at depths near enough to the bottom of the pavement to have any adverse effect on the foundation materials and consequent pavement behavior.

Previous reports

7. Previous reports concerning the airfield pavements at CAFB are listed below. Pertinent data were extracted from them for use in this condition survey report.

* A table of factors for converting British units of measurement to metric units is presented on page vii.

** U. S. Department of Defense, "Unified Soil Classification System for Roads, Airfields, Embankments, and Foundations," Military Standard MIL-STD-619B, June 1968, U. S. Government Printing Office, Washington, D. C.

8. Condition survey reports:

- a. Ohio River Division Laboratories, CE, "Report of Rigid Pavement Condition Survey, Carswell Air Force Base, Texas," June 1947, Mariemont, Ohio.
- b. _____, "Condition Survey Report, Carswell Air Force Base, Texas," April 1951, Mariemont, Ohio.
- c. _____, "Condition Survey Report, Carswell Air Force Base, Texas," May 1956, Mariemont, Ohio.

9. Pavement evaluation reports:

- a. U. S. Army Engineer District, Dennison, CE, "Airfield Pavement Evaluation Report, Fort Worth Army Airfield, Texas," June 1944, Dennison, Texas.
- b. Ohio River Division Laboratories, CE, "Pavement Evaluation Report, Carswell Air Force Base, Texas," November 1959, Cincinnati, Ohio.

History of Airfield Pavements

Design and construction history

10. The pavements constructed during the period 1941-1943 were designed to support World War II bombers. Pavements constructed during the period 1944-1946 were designed to support the B-36 aircraft. Pavements constructed during the period 1947-1955 were designed for either B-36 or B-47 aircraft. Pavements constructed during the period 1956-1965 were designed for B-52 aircraft loads. Details of the construction history of the airfield pavements are presented in table 2. Pavement thicknesses, descriptions, and other details are presented in table 3.

Traffic history

11. A detailed traffic record was not available for this study; however, some approximation of the traffic can be made from the records that are available. Prior to 1951, the airfield was used by B-36, B-25, C-47, C-45, C-119, and other smaller aircraft. Traffic records for the years 1951-1957 show that 1200 cycles* per month were flown at CAFB.

* A cycle of operation is one takeoff and one landing.

Of this total traffic, approximately 65 percent consisted of B-36 aircraft operations, and approximately 35 percent consisted of miscellaneous B-25, C-47, C-45, C-119, and other similar aircraft operations. Records for the years 1957-1960 indicate that approximately 37 cycles per month of B-47, 80-90 cycles of B-52, 149 cycles of KC-135 and KC-97, 37 cycles of cargo aircraft, and 1227 cycles of all other aircraft were applied. Traffic records were not available for the years 1960-1964 and 1968-1971, but it is reasonable to assume that the amounts of traffic for these periods were approximately the same as those for the period July 1964-June 1967. During this period, 80-90 cycles per month of B-52; 73 cycles of KC-135; 63 cycles of heavy cargo aircraft (i.e., C-135, C-124, C-141, and C-133); and 667 cycles of all other aircraft were applied. Traffic records indicate that the following amounts of traffic were applied during November 1971-October 1972: 1000 cycles per month of light aircraft; 1125 cycles of T-37, T-38, and T-39 aircraft; and 3375 cycles of heavy aircraft. Approximately 100 cycles of B-52 aircraft traffic were applied, since this airfield is a pilot training base.

12. More than 50 percent of the takeoffs and landings at CAFB are from the south (35) end of the runway.

Conditions of Pavement Surfaces

Pavement inspection procedure

13. The following procedure was used in conducting the inspection of the rigid pavements. Representative features were selected for detailed inspection. The features were then inspected slab* by slab, and the defects were recorded. The locations of the individual pavement features, the inspection starting points, and the directions in which the pavements were inspected (shown by arrows) are indicated in plate 1. The results of the pavement survey for those features that were inspected in detail are presented in table 4. This table shows a

* A slab is the smallest unit, containing no joints, of a given pavement feature.

quantitative breakdown of the various types of defects and a condition rating for each feature inspected in detail. The procedures used for determining the condition rating of a pavement are given in Appendix III, of Department of the Army Technical Manual TM 5-827-3, "Rigid Airfield Pavement Evaluation," dated September 1965.

Runway

14. All the 15-, 16-, and 18-in. portland cement concrete (PCC) pavements, features R1A, R2B, R5C, R6C, R7C, R8B, R9A, and R10D, were in excellent structural condition, with only 18 major defects noted. Photo 1 shows epoxy patches used to correct surface irregularities in several slabs near the south end of the runway. These irregularities resulted from an aircraft having burned at this location. Features R4C and R3C, which had been overlaid with asphaltic-concrete (AC) pavement, were in good condition. At the time of the overlay, a french drain was installed along the west side of the runway. The drain seems to have cured the problem of slab settlement. Photos 2 and 3 show the condition of the AC pavement on the runway.

Taxiways

15. The conditions of the PCC taxiways ranged from good to excellent. The AC portion of taxiway D was in fair condition, but this taxiway is used only as an access to the power check pad. Four pumping joints were noted near the south end of the parallel taxiway.

Aprons

16. The conditions of the apron areas ranged from very good to excellent based on the percentages of slabs containing no major defects. The apron areas have required considerable patching to correct mostly minor defects. Some areas have been overlaid with AC pavement rather than patching the PCC pavement. The apron taxiway on the south apron was overlaid because of defects that were load related.

Maintenance

17. Maintenance of the airfield pavements at CAFB has generally consisted of mudjacking, joint sealing, overlaying, replacing AC

pavements with PCC pavements, and slurry sealing AC shoulder pavements.

Maintenance expenditures at CAFB have been as follows:

<u>Period</u>	<u>Amount</u>	<u>Period</u>	<u>Amount</u>
1958-60	\$181,861	FY 1967	\$395,709
FY 1962	46,488	FY 1968	86,795
FY 1963	451,980	FY 1969	23,175
FY 1964	10,450	FY 1970	175,139
FY 1965	93,904	FY 1971	61,130
FY 1966	132,299		

Evaluation

18. A summary of the pavement evaluation is presented in table 5. Previously published pavement evaluations were updated to eliminate aircraft that are no longer in the Air Force inventory and to include aircraft that have been added to the inventory since the last pavement evaluation. The evaluation is based on the pavement thickness, flexural strength (PCC), base and subbase thickness and strength, strength of the subgrade (CBR or k value), and the structural condition of the pavement.

Conclusions

19. The following statements summarize the findings of this inspection: (1)

- a. The PCC pavements were in good to excellent structural condition; (2)
- b. The problem that had existed on the runway of slab settlement was apparently solved with the installation of the french drain along the western edge; (3)
- c. The portion of the runway overlaid with AC was in good condition; and (4)
- d. Epoxy patches on the aprons were performing satisfactorily, even though some were beginning to show deterioration.

Table 1
Climatic Data

<u>Month</u>	<u>1971 Average Temperature, F</u>	<u>Departure from Normal, F</u>	<u>1971 Precipi- tation, in.</u>	<u>Departure from Normal, in.</u>
January	46.7	1.2	0.19	-1.85
February	49.2	0.0	1.32	-0.92
March	55.6	-0.3	0.34	-2.17
April	64.0	-0.8	2.76	-0.84
May	70.5	-2.2	1.88	-2.71
June	82.9	1.4	0.83	-2.15
July	84.4	-1.0	3.60	1.85
August	79.5	-5.9	5.70	4.02
September	77.1	-1.3	3.24	0.70
October	70.1	2.2	7.64	5.05
November	57.0	2.2	1.77	-0.69
December	52.2	4.5	6.77	4.64
Annual	65.8	0.0	36.04	4.93

Note: Highest temperature in 1971 was 103 F on July 19; lowest temperature in 1971 was 12 F on February 8.

Table 2
Airfield Construction History

Feature	Pavement Thickness, in.	Type	Construction Period
N-S runway			
Sta 0+00 to 81+75	27-18-27	PCC	1945-46
Sta 20+75 to 81+75	2 to 5-1/2	AC*	1963
Sta 81+75 to 105+00	16	PCC **	1953
Sta 81+75 to 87+50	2 to 5-1/2	AC*	1963
Sta 105+00 to 115+00	18	PCC	1953
Sta 115+00 to 120+00	15	PCC **	1956
Sta 120+00 to 125+00	16	PCC **	1957
Sta 125+00 to 130+00 (225-ft-wide section)	18	PCC	1957
Sta 125+00 to 130+00 (75-ft-wide section)	16	PCC	1957
South connecting taxiway			
Sta 115+00 to 126+25	16-18-16	PCC	1956
Sta 126+25 to 139+35	18	PCC	1956
North connecting taxiway and parallel taxiway			
Sta 0+00 to 80+50	27	PCC	1959
Sta 80+50 to 115+00	27	PCC	1959
Taxiway D			
375-ft-long west portion	18	PCC	1953-54
675-ft-long east portion	4	AC	1953-54
Taxiway C			
Center portion	21	PCC	1957
Outside lanes	19 to 17	PCC	1957
SAC alert apron taxiway			
Original NE-SW runway	8-6-8	PCC	1942
3600-ft-long NE portion reconstructed			
Center portion	19	PCC	1957
Outside lanes	19 to 17	PCC	1957
Taxiway H			
Original construction	8-6-8	PCC	1943
E and W ends reconstructed	15-10-15	PCC	1945-46
1000-ft-long center	12-8-12	PCC*	1945-46
Entire taxiway	5-1/2	AC*	1950
Entire taxiway reconstructed	23	PCC	1962

(Continued)

* Overlay.

** Extension.

Table 2 (Continued)

Feature	Pavement Thickness, in.	Type	Construction Period
Taxiway I			
Original construction	9-6-9	PCC	1942
Entire taxiway reconstructed	15-10-15	PCC	1945-46
50-ft-wide west portion	5 to 1/2	AC*	1950
50-ft-wide east portion	10 to 14	PCC*	1953-54
Taxiways E and F			
Original construction	2	AC	1942
Overlay of original construction	15-10-15	PCC	1945-46
Overlay of overlay	5-1/2	AC	1950
56-ft-wide center of taxi- way F reconstructed	23	PCC	1965
NW-SE taxiway			
Original NW-SE runway	8-6-8	PCC	1941
Entire taxiway reconstructed	15-10-15	PCC	1945-46
Entire taxiway reconstructed	17	PCC	1954
Taxiway G	28	PCC	1958-59
Taxiway B			
Center portion	19	PCC	1958
Outside lanes	19 to 17	PCC	1958
E-W taxiway			
Original E-W runway	8-6-8	PCC	1941
50-ft-wide center	4	AC*	1957
250-ft-wide west portion reconstructed	15-10-15	PCC	1945-46
250-ft-wide west portion	5-1/2	AC*	1957
Taxiways J and K and hangar aprons E and W (hangar access)	18	PCC	1958
North apron			
Original construction	8-6-8	PCC	1942
1st extension to original construction	9-6-9	PCC	1943
250-ft-wide west portion reconstructed	15-10-15	PCC	1943-46
125-ft-wide transition section	10 to 15	PCC*	1943-46
250-ft-wide west portion	10	PCC*	1953-54
350-ft-wide east portion	15	PCC*	1953-54

(Continued)

* Overlay.

(2 of 3 sheets)

Table 2 (Concluded)

Feature	Pavement Thickness, in.	Type	Construction Period
South apron			
Original construction	8-6-8	PCC	1942
Extension and widening of original construction	9-6-9	PCC	1943
625-ft-wide west portion reconstructed	15-10-15	PCC	1943-46
100-ft-wide transition section	10 to 15	PCC*	1943-46
525-ft-wide west portion	10	PCC*	1953-54
75-ft-wide east portion	15	PCC*	1953-54
Taxiway through apron			
Overlay	2	AC	1967
West extension	14	PCC	1953-54
East extension	14	PCC	1957
South warm-up apron	16	PCC	1957
North warm-up apron			
Original construction	15-10-15	PCC	1945-46
Overlay of original construction	5-1/2	AC	1950
Section reconstructed	17	PCC	1957
Alert aprons A and B	13	PCC	1953
Overlay of apron B	4	AC	1970
Power check pad	18	PCC	1953
Original stubs (9)	17	PCC	1954
Original stubs (9)	17	PCC	1957
Nose dock aprons (4)	18	PCC	1954
Transient apron	14	PCC	1953
Calibration hardstand	15	PCC	1953
Washrack	14	PCC	1954

* Overlay.

(3 of 3 sheets)

Table 3
SUMMARY OF PHYSICAL PROPERTY DATA

FACILITY NUMBER AND IDENTIFICATION	OVERLAY PAVEMENT			PAVEMENT			BASE			SUBGRADE			GENERAL CONDITION OF AREA CONSIDERED
	LENGTH FT	WIDTH FT	THICK. IN.	DESCRIPTION	THICK. IN.	DESCRIPTION	FLEX. STR. PSI	THICK. IN.	CLASSIFICATION	CBR OR K	CLASSIFICATION	CBR OR K	
81A NS runway 1st 500 ft, 17 end	500	300			18	Portland cement con- crete 27-15-27-41, reinforced 3/8-in.-in.	650				Clay (CL)	75	Excellent
82B NS runway 17 end Sta 15+00 to 20+75	575	300			18	Portland cement con- crete 27-15-27-41, reinforced 3/8-in.-in.	650				Clay (CL)	75	Excellent
83C NS runway interior Sta 20+75 to 31+75	6100	300	5.5 to 2	Asphaltic concrete $h_E = 19.79$	18	Portland cement con- crete 27-15-27-41, reinforced 3/8-in.-in.	650				Clay (CL)	75	Fair
84C NS runway interior Sta 31+75 to 37+50	575	300	5.5 to 2	Asphaltic concrete $h_E = 17.68$	16	Portland cement concrete	650				Clay (CL)	75	Good
85C NS runway interior Sta 37+50 to 105+00	1750	300			16	Portland cement concrete	650				Clay (CL)	75	Excellent
86C NS runway interior Sta 105+00 to 115+00	1000	300			18	Portland cement concrete	650				Clay (CL)	75	Excellent
87C NS runway interior Sta 115+00 to 120+00	500	300			15	Portland cement concrete	750	6	Select material	200	Clay (CL)	75	Excellent
88B NS runway 2nd 500 ft, 35 end	500	300			16	Portland cement concrete	750	6	Select material	200	Clay (CL)	75	Excellent
89A NS runway 1st 500 ft, 35 end (25-45-ft-wide east portion)	500	225			18	Portland cement concrete	750	6	Select material	200	Clay (CL)	75	Excellent
910D NS runway 1st 500 ft, 35 end (75-ft-wide west portion)	500	75			16	Portland cement concrete	750	6	Select material	200	Clay (CL)	75	Excellent
71A North connecting taxiway and parallel taxiway Sta 0+00 to 80+50	8050	50			27	Portland cement concrete	750		lime stabilized subgrade	100	Sandy clay (CL)	75	Excellent
72A Parallel taxiway Sta 80+50 to 115+00	3450	50			27	Portland cement concrete	750	7	Gravel (old flexible pavement) subbase	75	Sandy clay (CL)	75	Excellent
73A Parallel taxiway Sta 115+00 to 126+05	1225	75			18	Portland cement con- crete 15-15-15-15	700	6	Select material	100	Sandy clay (CL)	75	Excellent
74A South connecting taxiway Sta 126+25 to 139+35	1310	75			18	Portland cement concrete	700	6	Select material	100	Sandy clay (CL)	75	Excellent
75C Taxiway B	1050	75			19	Portland cement con- crete 17-17-17-17	700				Sandy clay (CL)	75	Good
76C Taxiway C	1075	75			21	Portland cement con- crete 19-21-19-19	700	6	Select material	100	Clay (CL)	75	Excellent
77C Taxiway D	375	150			18	Portland cement concrete	650				Clay (CL)	75	Very good
78C Taxiway D	675	150		Asphaltic concrete	6								
79C Taxiway E	2800	Variable	3	Asphaltic concrete $h_E = 5.5$ center 0.5 edges 1.4 and 1.9 in. (3-5%)	10	Portland cement con- crete 15-10-15-15	650	2	Asphaltic concrete	175	Sandy clay (CL)	75	Fair

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Table 3 (continued)
SUMMARY OF PHYSICAL PROPERTY DATA

FACILITY NUMBER AND IDENTIFICATION	OVERLAY PAVEMENT			PAVEMENT			BASE			SUBGRADE		
	LENGTH FT	WIDTH FT	THICK IN.	DESCRIPTION	THICK IN.	DESCRIPTION	THICK IN.	CLASSIFICATION	CBR OR K	CLASSIFICATION	CBR OR K	
T10A Taxeway F	1155	56			23	Portland cement concrete	710			Sandy clay (CL)	75	
T11B Taxeway F	1155	22	3	Asphaltic concrete 5.5 center 0.5 sides	10	Portland cement concrete	680	2	Asphaltic concrete stabilized gravel	Sandy clay (CL)	75	
T12A West taxeway	3550	75			17	Portland cement concrete	650	6	Select material	Sandy clay (CL)	75	
T13A Taxeway through south apron	1740	75	2	Asphaltic concrete concrete $h_g = 16.7$ and 11.07 in. (B-32)	10	Portland cement concrete	610	6	Sand (SP)	Sandy clay (CL)	75	
T14a Taxeway G	766	75			28	Portland cement concrete	800	6	Select material	Sandy clay (CL)	75	
T15A SAC alert apron taxeway	2667	75			19	Portland cement concrete 17-19-17-in.	700	6	Select material	Sandy clay (CL)	75	
T16a Taxeway H	2232	50			23	Portland cement concrete	710			Sandy clay (CL)	75	
T17a Taxeway H end portion	335	50	3	Asphaltic concrete $h_g = 5.5$ center 0.5 edges 11.7 and 11.9 in. (B-32)	10	Portland cement concrete 15-10-15-in.	680			Sandy clay (CL)	75	
T18a Taxeway I east portion	335	50	10	Portland cement concrete (10-14 in.) $h_g = 14.9$	10	Portland cement concrete 15-10-15-in.	610	6	Sand (SP)	Sandy clay (CL)	75	
T19a Taxeway I west portion	450	Varies	3	Asphaltic concrete $h_g = 5.5$ center 0.5 edges 11.9 and 12.2 in. (B-32)	10	Portland cement concrete	680	10	Sand (SP)	Sandy clay (CL)	75	
T20B Taxeway J and AS1B Hangar access apron E stubs 3 and 4	Varies	Varies			18	Portland cement concrete	700			Sandy clay (CL)	75	
T21B Hangar access apron E stubs 1 and 2	Varies	Varies										
AS1B South warm-up apron	Varies	Varies			16	Portland cement concrete	700	6	Select material	Sandy clay (CL)	75	
AS2B Power check pad	700	300			18	Portland cement concrete	650			Clay (CL)	75	
AS3B North warm-up apron (abandoned)	Varies	Varies			10	Portland cement concrete	680			Sandy clay (CL)	75	
AS4B North apron (west portion)	1800	125	10	Portland cement concrete	650	10	Portland cement concrete	610	6	Sand (SP)	Sandy clay (CL)	75
AS5B South apron (west portion)	3150	Varies										

(2 of 3 sheets)

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Table 3 (continued)
SUMMARY OF PHYSICAL PROPERTY DATA

FACILITY		OVERLAY PAVEMENT				PAVEMENT				BASE		SUBGRADE		GENERAL CONDITION OF AREA CONSIDERED	CBR OR K
FACILITY NUMBER AND IDENTIFICATION	LENGTH FT	WIDTH FT	THICK IN.	DESCRIPTION	THICK IN.	DESCRIPTION	THICK IN.	CLASSIFICATION	CBR OR K	CLASSIFICATION	CBR OR K	CLASSIFICATION	CBR OR K		
A1B North apron	Varies	125	12 to 10	Portland cement concrete	650	10	Portland cement concrete	610	6	Sand (21)	100	Sandy clay (CL)	75	Excellent	Very good
A1B South apron			$h_2 = 14.2$ in.												
A2B North apron (east portion)	1400	350	15	Portland cement concrete	650	6	Portland cement concrete 3/4-1 in.	610	6	Sand (SF)	100	Sandy clay (CL)	75	Excellent	Very good
A2B South apron (east portion)	1400	75	15												
A1B North apron extension	350	200	15												
A1B Transient apron															
A1B South apron extension (west)	Varies	Varies	14	Portland cement concrete	650	4	Asphaltic concrete crushed stone ($K = 100$)	24	Gravel	300	Clay (CL)	75	Excellent	Very good	
A13B South apron extension (east)	Varies	Varies													
A1B Alert apron A and 25-ft strip of apron B	1150	200													
A15B Alert apron B	1700	225	4	Asphaltic concrete	13	Portland cement concrete	650	12	Stabilized gravel	200	Clay (CL)	75	Very good		
A16B Operational apron	1405	1445	4	Asphaltic concrete	6	Portland cement concrete 5/8-3/4 in.	650	6	Gravel	120	Sandy clay (CL)	75	Fair		
A17B Nine original stubs	Varies	Varies													
A18B Nine new parking stubs	Varies	Varies													
A19B Inishmack	Varies	Varies													
A20B Calibration hardstand and taxiway	Varied	Varies													
R1X N-S runway overrun north end	10,000	300													
R1X N-S runway blast pad south end	250	300													
R1X N-S runway overrun south end	950	300													

COPY AVAILABLE TO DDC DOES NOT
PERMIT FULLY LEGIBLE PRODUCTION

Table 4

FEATURE		Slab size ft	APPROX. NO. OF SLABS	PANE L. THICK. IN.	NO. OF SLABS CONTAINING INDICATED DEFECTS												% OF SLABS NO. DEFECTS				% OF SLABS NO. DEFECTS				
					1	-	\	△	*	K	~~	S	J	↓	M	♦	J	♦	M	P	O	C	D		
R1A	N-S runway; 1st 500 ft, 17 end	25 by 35	240	18			4				1								1				97.5	98.3	Excellent
R2B	N-S runway Sta 15+00 to 20+75	25 by 25	276	18			4			4	1	1						1	1			96.7	98.5	Excellent	
R5C	N-S runway; interior	25 by 25	1564	16	3	1		5			3	4	3	2				9	7			97.6	99.1	Excellent	
R7C					18	15																			
R8B	N-S runway; 2nd 500 ft, 35 end	25 by 25	240	16			1												2				98.7	99.5	Excellent
R9A	N-S runway; 1st 500 ft, 35 end	25 by 25	240	18															1				99.5	100.0	Excellent
R10D					16																				
T1A	North connecting TMA taxiway, and TMA south connecting taxiway	25 by 25	1231	27	18		2	1			11	1	3					4	4	2		96.5	98.4	Excellent	
T2C	Taxiway B	25 by 25	174	19	15	3	4		6	2	10								1				83.5	85.6	Good
T6C	Taxiway C	25 by 25	183	21	1			1															98.9	98.9	Excellent
T10A	Taxiway F	25 by 25	110	23													1		1		1	98.1	100.0	Excellent	

REMARKS:

LEGEND:

- LONGITUDINAL CRACK
- TRANSVERSE CRACK
- \ DIAGONAL CRACK
- △ CORNER BREAK
- * SHATTERED SLAB
- K KEVED JOINT FAILURE
- ~~ SHRINKAGE CRACK
- S SCALING
- J SPALL ON TRANSVERSE JOINT
- ↓ SPALL ON LONGITUDINAL JOINT
- ♦ CORNER SPALL
- ◆ SETTLEMENT
- M MAP CRACKING
- P PUMPING JOINT
- O POP-OUT
- C UNCONTROLLED CONTRACTION CRACK
- D "D" CRACKING

Table 4 (Continued)

FEATURE		SLAB SIZE FT	APPROX NO. OF SLABS	PAVE, THICK IN.	NO. OF SLABS CONTAINING INDICATED DEFECTS												% OF SLABS NO MAJOR DEFECTS	% OF SLABS NO MAJOR DEFECTS	
NO.	DESIGNATION				1	—	△	*	K	~~	S	J	↗	J	♦	M	P	O	C
T1a	Taxiway G	25 by 25	70	28															100.0
T1a	SAC apron taxiway	25 by 25	193	19					4		1	6	2	2					91.7
T1a	Taxiway H	25 by 25	177	23										1					99.4
T2b	Taxiway J and A21B Hangar access Apron E stubs 3 and 4	25 by 25	467	18										3					97.8
T2b	Taxiway K and han- gar access apron N	25 by 25	342	18										1	1	4			97.9
A1B	South warm-up apron	25 by 25	256	16										2					98.4
A2B	Power check pad	25 by 25	423	18		1	1	2						1	1	1	1	1	97.6
A4B	North apron	12-1/2 by 20	4293	10/10 15 to 12-1/2 by 15	31	2	4	20			33	1	5	7	13	1	5	30	96.7
A6B																			
A8B																			

REMARKS:

LEGEND:

- LONGITUDINAL CRACK
- TRANSVERSE CRACK
- △ DIAGONAL CRACK
- ★ CORNER BREAK
- ◆ SHATTERED SLAB
- K KEYED JOINT FAILURE

M MAP CRACKING
 P PUMPING JOINT
 O POP OUT
 C UNCONTROLLED
 D CONTRACTION CRACK
 ♦ "D" CRACKING
 ♣ SETTLEMENT

COPY AVAILABLE TO DDC DOES NOT
PERMIT FULLY LEGIBLE PRODUCTION

Table 4 (Continued)

DATE: 12/20/00

SUMMARY OF DATA - BIG/GID PAVEMENT CONDITION SURVEY

DEMARKS.

LEGEND: | — \ △ * K

 LONGITUDINAL CRACK
 TRANSVERSE CRACK
 DIAGONAL CRACK
 CORNER BREAK
 SHATTERED SLAB
 KEYED JOINT FAILURE

M	MAP CRACKING
P	PUMPING JOINT
O	POP-OUT
C	UNCONTROLLED CONTRACTION CRACKING
D	DOOR CRACKING
S	SHRINKAGE CRACK
J	SCALING
T	SPALL ON TRANSVERSE JOINT
L	SPALL ON LONGITUDINAL JOINT
Y	CORNER SPALL
Z	SETTLEMENT

WES FORM NO. 2004
JUN 1972

(3 of 3 sheets)

COPY AVAILABLE TO DDC DOES NOT
PERMIT FULLY LEGIBLE PRODUCTION

Table 5
SUMMARY OF PAVEMENT EVALUATION

NAME OF AIRFIELD: Carswell AFB		LOAD-CARRYING CAPACITY IN LB OF GROSS PLANE LOAD FOR INDICATED LANDING GEAR TYPES AND CONFIGURATIONS															
DATE OF EVALUATION MONTH Dec YR 1972		TRICYCLE ARRANGEMENT															
NO.	FEATURE DESIGNATION	PAVEMENT OPERATIONAL USE	SINGLE 100-SQ-IN. CONTACT AREA			SINGLE TANDEM 241-SQ-IN. CONTACT AREA			SINGLE TANDEM 226-SQ-IN. CONTACT AREA			TWIN TANDEM 33 IN. x 46 IN. 208-SQ-IN. CONTACT AREA EACH TIRE			C-S-A GEAR CONFIGURATION	TWIN TWIN SPEC 3742-7 207-SQ-IN. CONTACT AREA EACH TIRE	REMARKS
			1	2	3	4	5	6	7	8	9	10					
R1A	N-S runway; 1st 500 ft, 17 end	Capacity	155,000+	85,000+	155,000+	210,000	200,000+	195,000	245,000	320,000	800,000+	280,000					
R2B	N-S runway, sta 15+0 to 20+75 Power check pad	Capacity	155,000+	85,000+	155,000+	210,000	200,000+	235,000	285,000	370,000	800,000+	300,000					
A2B	N-S runway, sta 20+75 to 34+75	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	380,000+	800,000+	460,000					
R4C	N-S runway, sta 81+75 to 87+50	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	300,000	330,000+	380,000+	800,000+	390,000					
R5C	N-S runway, sta 87+50 to 105+00	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	255,000	320,000	380,000+	800,000+	330,000					
R6C	N-S runway, sta 105+00 to 115+00 Taxiway D	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	310,000	330,000+	380,000+	800,000+	400,000					
R7C	N-S runway, sta 115+00 to 120+00	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	380,000+	800,000+	470,000					
R8B	N-S runway; 2nd 500 ft, 35 end	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	285,000	330,000+	380,000+	800,000+	390,000					
R9A	N-S runway; 1st 500 ft, 35 end	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	285,000	330,000+	380,000+	800,000+	430,000					
T1A	North connect- ing taxiway and parallel taxiway	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	380,000+	800,000+	580,000					
T2A	Parallel taxiway	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	380,000+	800,000+	560,000					
T3A	Parallel taxiway South connect- ing taxiway	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	220,000	280,000	370,000	800,000+	320,000					

Note: + sign denotes allowable gross loading greater than maximum gross weight of any existing aircraft having indicated gear configuration.

(a) denotes allowable gross loading less than minimum gross weight of any existing aircraft having indicated gear configuration.

(1 of 3 sheets)

Table 5 (Continued)
SUMMARY OF PAVEMENT EVALUATION

NAME OF AIRFIELD: Carswell AFB		LOAD-CARRYING CAPACITY IN LB OF GROSS PLANE LOAD FOR INDICATED LANDING GEAR TYPES AND CONFIGURATIONS																	
DATE OF EVALUATION MONTH: Dec YR: 1972		TRICYCLE ARRANGEMENT																	
NO.	FEATURE DESIGNATION	PAVEMENT OPERATIONAL USE			SINGLE 100-PSI TIRE PRESSURE			SINGLE 24-SQ-IN. CONTACT AREA			TWIN TANDEM 26-SQ-IN. CONTACT AREA EACH TIME			TWIN TANDEM 33-IN. x 6-IN. 208-SQ-IN. CONTACT AREA EACH TIRE			BICYCLE		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14				
T5C	Taxiway B	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	380,000+	800,000+	470,000								
T5C	Taxiway C	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	380,000+	800,000+	580,000								
T5C	Taxiway D (AC portion)	Capacity	155,000+	85,000+	155,000+	180,000	200,000+	280,000	320,000	340,000	330,000+								
T5A	Taxiway E	Capacity	95,000	80,000	115,000	140,000	165,000	135,000	180,000	255,000	750,000	(s)							
T10A	Taxiway F	Capacity	155,000+	85,000+	155,000+	220,000+	200,000	310,000	330,000+	380,000+	800,000+	430,000							
T16A	Taxiway H																		
T12A	W-SE taxiway	Capacity	150,000	85,000+	155,000+	205,000	200,000+	190,000	210,000	320,000	800,000+	280,000							
T13A	Taxiway through south apron	Capacity	140,000	85,000+	150,000	195,000	200,000+	180,000	230,000	300,000	800,000+	280,000							
T14A	Taxiway G	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	380,000+	800,000+	600,000+							
T15A	SAC alert apron taxiway	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	240,000	300,000	380,000+	800,000+	350,000							
T17A	Taxiway H (end portion)	Capacity	80,000	65,000	90,000	115,000	150,000	110,000	145,000	200,000	590,000	(s)							
T18A	Taxiway I (east portion)	Capacity	115,000	85,000+	130,000	165,000	200,000+	155,000	195,000	265,000	790,000	230,000							
T19A	Taxiway I (west portion)	Capacity	85,000	70,000	95,000	120,000	155,000	115,000	150,000	205,000	620,000	(s)							
T20B	Taxiway J and AC1B Hangar access apron	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	255,000	310,000	380,000+	800,000+	330,000							
T21B	Taxiway K and AC2B Hangar access apron W stub 1, 2, 3, and 4																		
A1B	South warm-up apron	Capacity	145,000	85,000+	155,000+	200,000	200,000+	220,000	275,000	370,000	800,000+	290,000							

(2 of 3 sheets)

WES FORM NO. 399 EDITION OF AUG 1960 IS OBSOLETE.

COPY AVAILABLE TO DDC DOES NOT
PERMIT FULLY LEGIBLE PRODUCTION

JUNE 1972

Table 5 (Continued)
SUMMARY OF PAVEMENT EVALUATION

NAME OF AIRFIELD: Charswell AFB		LOAD-CARRYING CAPACITY IN LB OF GROSS PLANE LOAD FOR INDICATED LANDING GEAR TYPES AND CONFIGURATIONS											
DATE OF EVALUATION MONTH Dec YEAR 1972		TRICYCLE ARRANGEMENT											
FEATURE	PAVEMENT OPERATIONAL USE	SINGLE 100-PS TIRE PRESSURE	SINGLE 100-PS TIRE PRESSURE	SINGLE 247-SQ-IN. CONTACT AREA	SINGLE 247-SQ-IN. CONTACT AREA	TWIN TANDEM 280-SQ-IN. CONTACT AREA EACH TIRE	TWIN TANDEM 335-SQ-IN. CONTACT AREA EACH TIRE	BICYCLE					
NO.	DESIGNATION	1	2	3	4	5	6	7	8	9	10	REMARKS	
A1B	North apron (west portion)	Capacity	115,000	85,000+	155,000	165,000	200,000+	185,000	230,000	310,000	800,000+	210,000	
A5B	South apron (west portion)												
A6B	North apron	Capacity	110,000	85,000+	145,000	155,000	200,000+	175,000	220,000	295,000	800,000+	235,000	
A7B	South apron												
A8B	North apron (east portion)	Capacity	155,000+	85,000+	155,000+	210,000	200,000+	230,000	285,000	380,000+	800,000+	300,000	
A9B	South apron (east portion)												
A10B	North apron extension												
A11B	Transient apron South apron ex- tension (west)	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	260,000	330,000+	380,000+	800,000+	370,000	
A12B	South apron ex- tension (west)												
A13B	Capacity	130,000	85,000+	155,000+	195,000	200,000+	220,000	290,000	380,000+	600,000+	800,000+	310,000	
A14B	Alert apron A and 25 ft strip of apron B	Capacity	115,000	85,000+	155,000+	170,000	200,000+	195,000	250,000	360,000	800,000+	270,000	
A15B	Alert apron B	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	270,000	330,000+	380,000+	800,000+	360,000	
A16B	Operational apron	Capacity	50,000	35,000	70,000	75,000	110,000	80,000	(a)	155,000	140,000	(a)	
A17B	Nine original stubs	Capacity	145,000	85,000+	155,000+	200,000	200,000+	225,000	280,000	370,000	800,000+	295,000	
A18B	Nine new parking stubs	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	245,000	310,000	380,000+	800,000+	320,000	
A19B	Watchtrack	Capacity	115,000	85,000+	150,000	160,000	200,000+	180,000	225,000	310,000	800,000+	240,000	
A20B	Calibration hardstand and taxiway	Capacity	115,000	85,000+	145,000	160,000	200,000+	175,000	220,000	290,000	800,000+	210,000	

(3 of 3 sheets)

WES FORM NO. 999
JUNE 1972
EDITION OF AUG 1960 IS COMPLETE.

COPY AVAILABLE TO BBC DOES NOT
PERMIT FULLY LEGIBLE PRODUCTION



Photo 1. Epoxy patches near south end of runway



Photo 2. General view of runway looking south
from sta 60+00

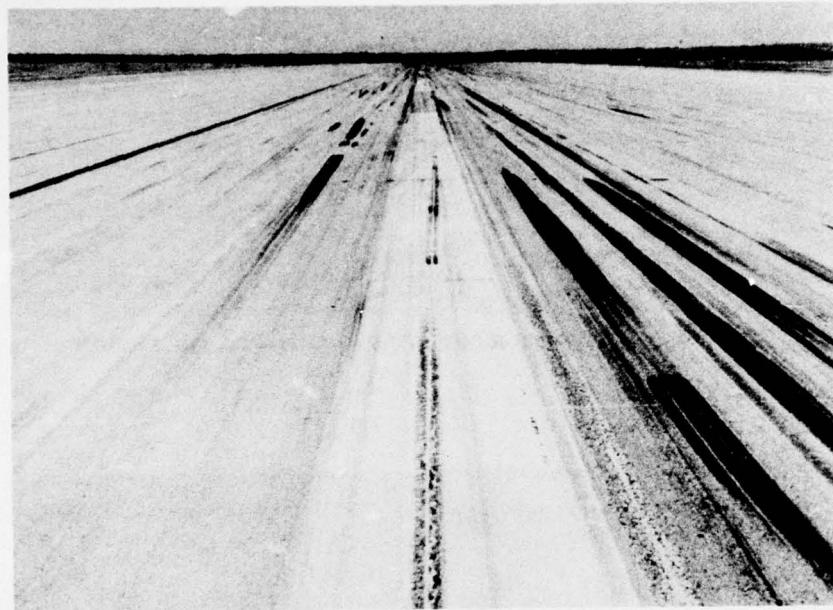
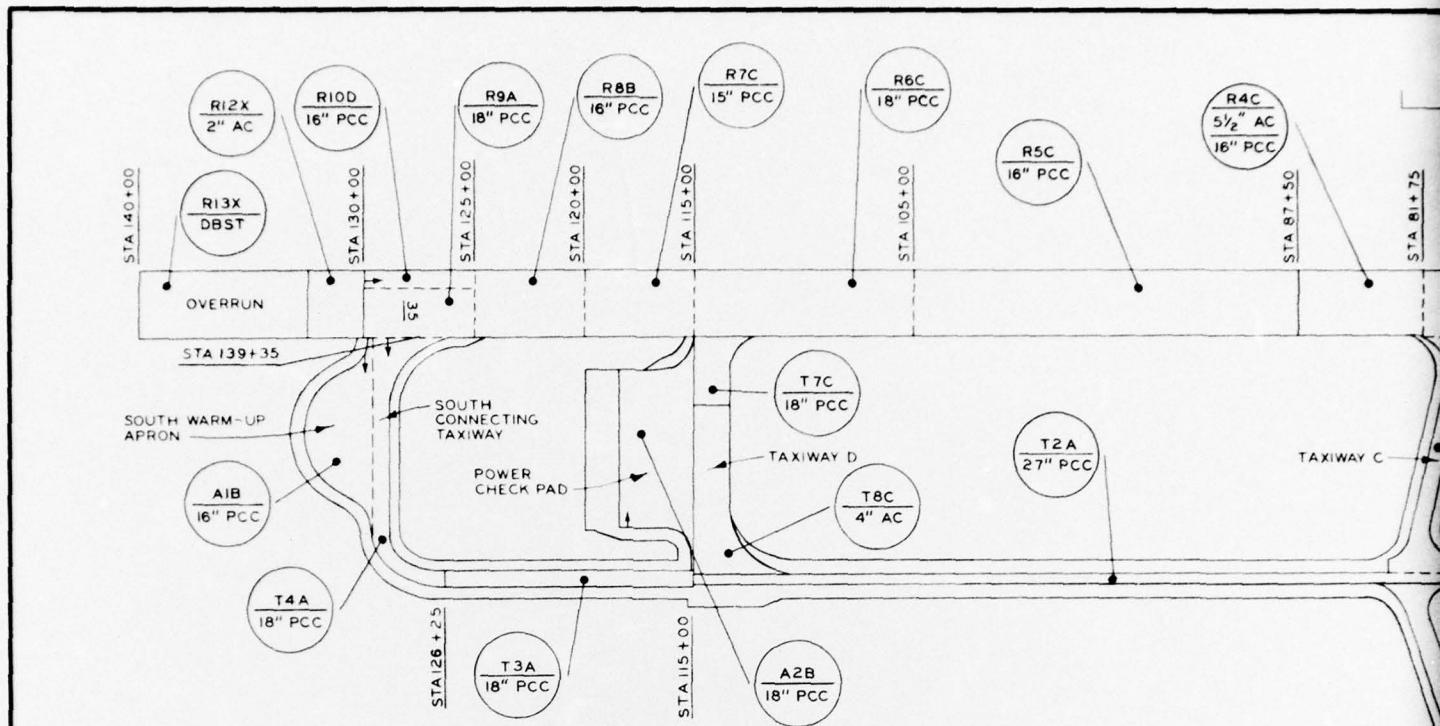


Photo 3. General view of runway looking north
from sta 60+00



LEGEND

 ← FEATURE DESIGNATION (SEE NOTE 1)
 ← SURFACE PAVEMENT THICKNESS AND TYPE

TYPE OF FEATURE

R-RUNWAY
 T-TAXIWAY
 A-APRON

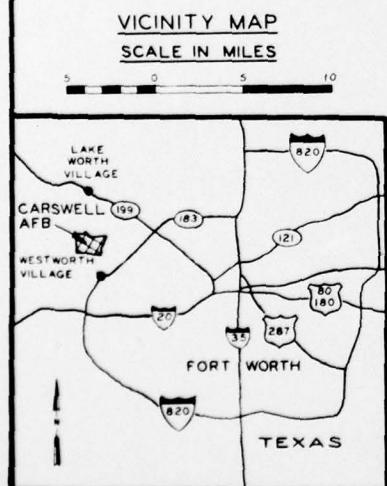
TYPE TRAFFIC AREA (SEE NOTE 2)

A-A TYPE TRAFFIC AREA
 B-B TYPE TRAFFIC AREA
 C-C TYPE TRAFFIC AREA
 D-D TYPE TRAFFIC AREA
 X-NO TRAFFIC TYPE ASSIGNED

AC-ASPHALTIC CONCRETE
 PCC-PORTLAND CEMENT CONCRETE
 DBST-DOUBLE BITUMINOUS SURFACE TREATMENT

→ DIRECTION OF SURVEY

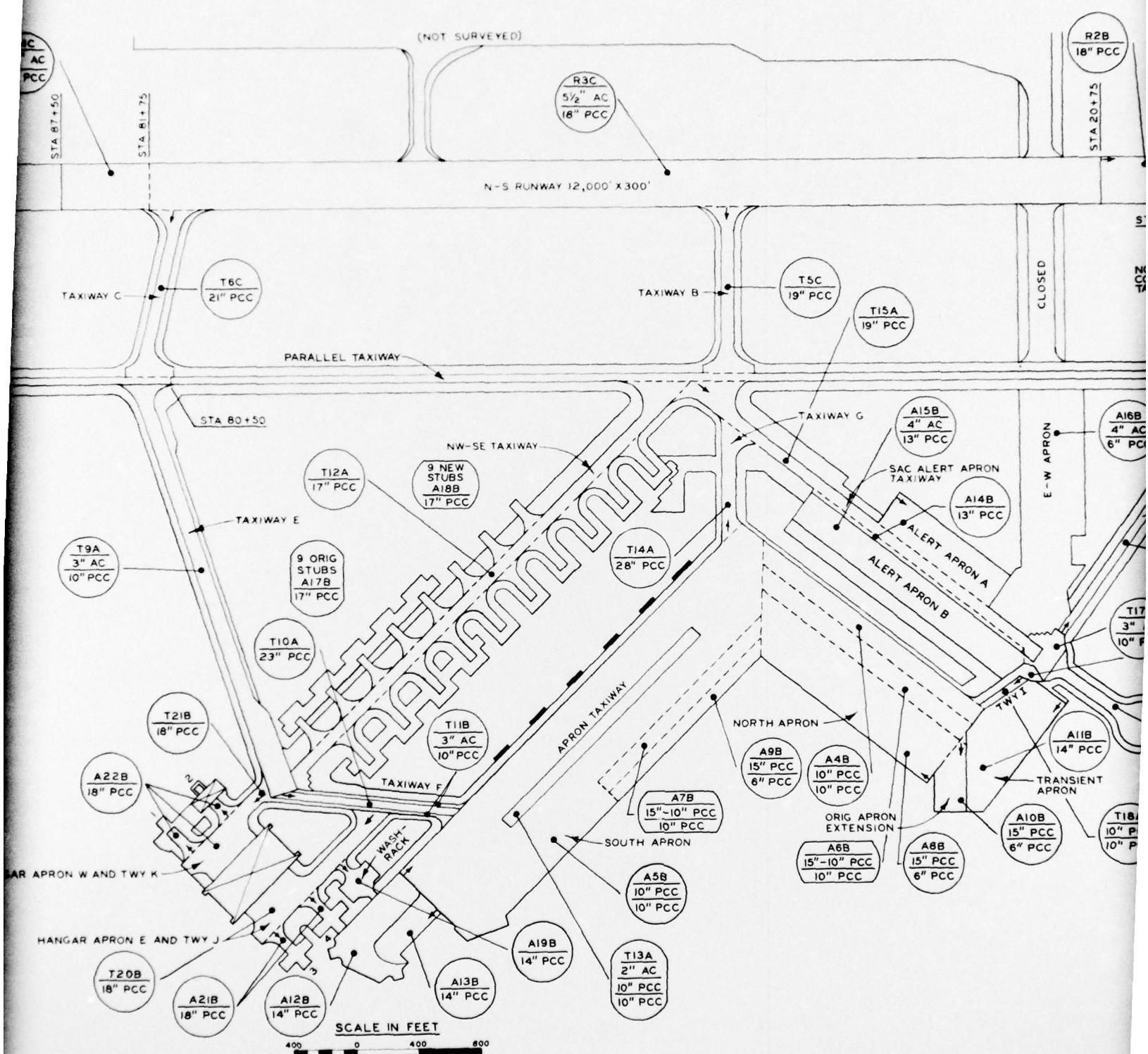
NOTES: 1. FEATURE DESIGNATION DENOTES TYPE OF FEATURE,
 NUMBER OF FEATURE FOR GIVEN TYPE, AND TYPE
 TRAFFIC AREA.
 2. TRAFFIC AREA DESIGNATIONS ARE BASED ON
 HEAVY-LOAD CRITERIA.



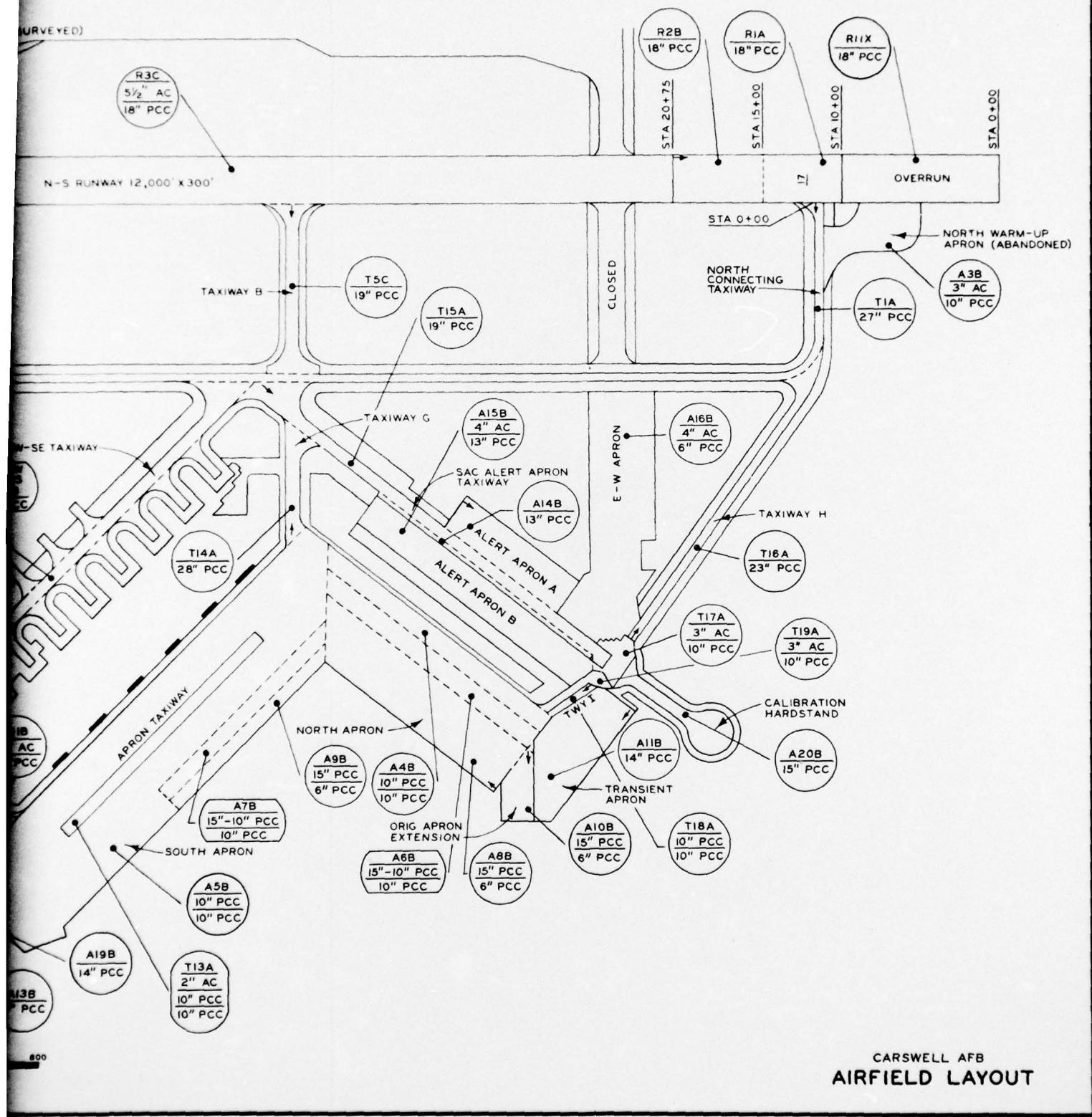
HANGAR APRON W AND TWY K

HANGAR APRON E A





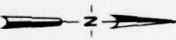
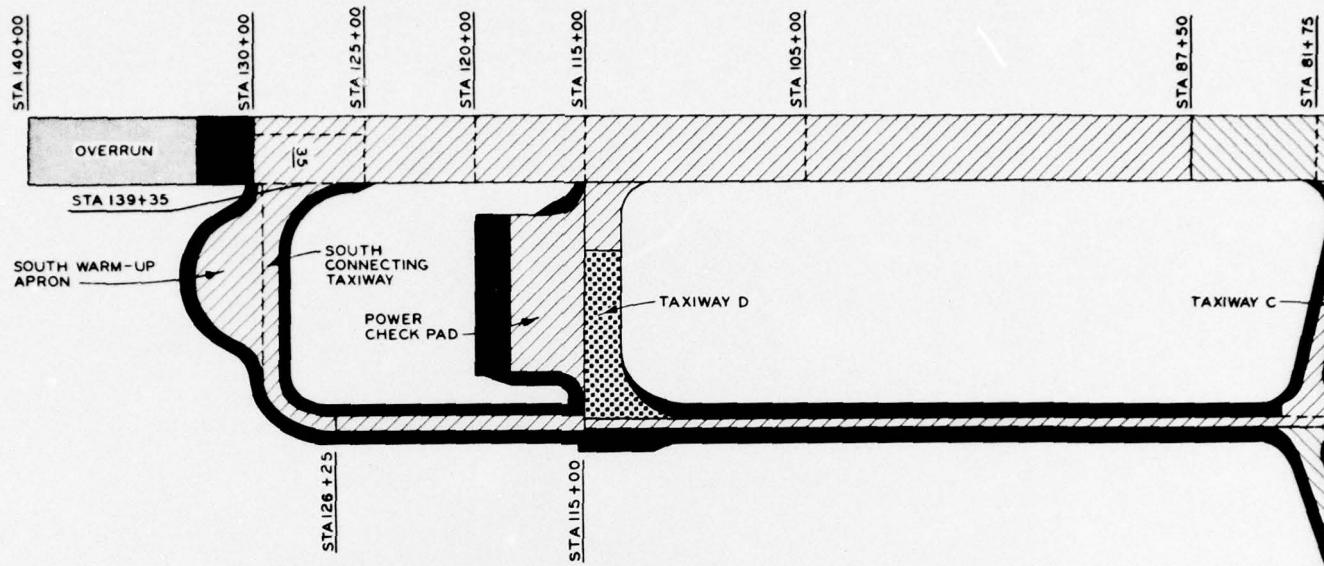
SURVEYED)



CARSWELL AFB
AIRFIELD LAYOUT

PLATE 1

3



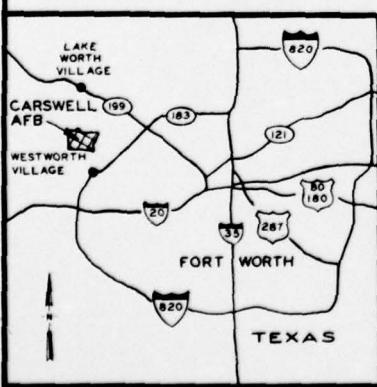
LEGEND

- [Hatched pattern] PORTLAND CEMENT CONCRETE (PCC)
- [Cross-hatched pattern] ASPHALTIC CONCRETE (AC)
- [Diagonal hatching] ASPHALTIC CONCRETE OVER PORTLAND CEMENT CONCRETE
- [Horizontal hatching] PORTLAND CEMENT CONCRETE OVER PORTLAND CEMENT CONCRETE
- [Solid black] DOUBLE BITUMINOUS SURFACE TREATMENT (DBST)
- [Solid black] BLAST PAVEMENT (AC NON-TRAFFIC)

VICINITY MAP

SCALE IN MILES

0 5 10



HANGAR APRON W AND TWY K

HANGAR APRON E AND 1

